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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,915	03/19/2004	Keisuke Inoue	107355-00111	6389

7590

08/24/2006

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Washington, DC 20036-5339

EXAMINER
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YEE, DEBORAH

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 08/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/803,915	<b>Applicant(s)</b> INOUE ET AL.	
	<b>Examiner</b> Deborah Yee	<b>Art Unit</b> 1742	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3-19-04</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 to 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese patent 2002-212672 cited by applicant in IDS dated March 19, 2004 in view of Japanese patent 2002-348615 or Japanese patent 63-195257.

3. JP'672 on page 5 in Table 1 discloses specific carburized steel examples that meet the claimed composition. Moreover, the prior art examples in Table 2 exhibit a surface density of carbides having a diameter of no more than 0.5 microns in the surface layer part within 50 microns from the surface at 6.2 pieces/ 10 micron<sup>2</sup> or higher, and the ratio of the number of the carbides with a diameter of up to 0.5 microns is at least 90.5% which would suggest and overlap the claimed area ratio of surface carbides from 5 to 15% wherein at least 90% of carbides having a grain size of 5 microns or less.

4. Moreover, the English abstract of JP'672 teaches producing steel member by carburizing, quenching and tempering. Even though prior art does not specifically teach vacuum carburizing as recited by the claims, such would not be a patentable distinction. Note that it is well known in the art to vacuum carburize analogous steel parts to improve fatigue strength as evident by the English abstracts of JP'615 and JP'257.

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Since fatigue strength would be a desired and sought property by JP'672 , then it would be an obvious modification well within the skill of the artisan to apply vacuum carburizing to produce no more than the known and expected effect from such a process step.

5. Even though a grain boundary oxide layer with a depth of 1 micron or less as recited by the claim is not taught by prior art, such property would be expected when vacuum carburizing is applied. Note that vacuum creates a protective non-reactive atmosphere; hence steel is not exposed to oxygen and the production of oxides would be kept to a minimum.

6. Also JP'672 in paragraphs 24 to 26 on page 4 discloses additional alloying elements having wt% ranges that overlap or encompass those recited by one or more of the dependent claims.

7. In regard to method claim, JP'672 teaches carburizing, quenching and tempering to produce steel parts for machine structures. Although working alloy prior to carburizing as recited by the method claims is not taught by prior art, such would be inferred since steel part obviously has to be formed and shaped by mechanical working in order to produce a steel part for a machine structure.

8. In regard to claim 23, JP'672 discloses a steel part for a machine structure which would broadly include a gear.

9. Claims 1 to 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese patent 2000-87213 in view of Japanese patent 2002-212672, Japanese patent 2002-348615 and Japanese patent 63-195257.

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10. JP'213 in paragraphs 22 and 25 on page 4 discloses a steel rolling part having a composition which meets claim 1. Moreover, steel is carburized and has properties as shown in the table on page 6 similar to the present invention. See example 6 having a surface carbon ratio of 1.15% (within claimed range of 1 to 1.5%) with an area ratio of carbides at 13.7% (within claimed range of 5 to 15%) with 91% carbides at 1.85 microns (within claimed 90% of carbides having a grain size of 5 microns or less). Also note prior art example 13 meets claimed limitations.

11. Even though additional elements (B, Ti, Nb, Bi, Ca, etc) recited by dependent claims is not taught by JP'672, such would be obvious to incorporate because they are well known in the art as common additives to further enhance strength and toughness properties for analogous steel parts used for machine structures as evident by JP'672 in the English abstract on paragraphs 24 to 26 on page 4 .

12. Moreover, the English abstract of JP'213 teaches producing steel member by carburizing. Even though prior art does not specifically teach vacuum carburizing as recited by the claims, such would not be patentable distinction. Note that it is well known in the art to vacuum carburize analogous steel parts to improve fatigue strength as evident by the English abstracts of JP'615 and JP'257. Since fatigue strength would be a desired and sought property by JP'672 , then it would be an obvious modification well within the skill of the artisan to apply vacuum carburizing to produce no more than the known and expected effect from such a process step.

13. Even though prior art does not teach a grain boundary oxide layer with a depth of 1 micron or less as recited by the claim is not taught by prior art, such property would be

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expected when vacuum carburizing is applied. Note that vacuum creates a protective non-reactive atmosphere; hence steel is not exposed to oxygen and the production of oxides would be kept to a minimum.

14. In regard to method claim, JP'213 teaches carburizing steel stock for rolling parts. Although working alloy prior to carburizing as recited by the method claims is not taught by prior art, such would be inferred since steel part obviously has to be formed and shaped by mechanical working in order to produce a steel stock for rolling part.

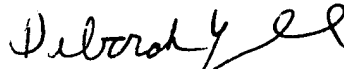
15. In regard to claim 23, JP'213 discloses a steel stock for rolling part, and would broadly include and suggest a gear.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah Yee whose telephone number is 571-27211253. The examiner can normally be reached on monday, Tuesday and Thursday 6:00am-2:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Deborah Yee  
Primary Examiner  
Art Unit 1742

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